

What is claimed is:

- 1 1. A method of etching an uniform silicon layer,
2 comprising:
3 providing a patterned silicon layer;
4 forming an etching buffer layer conformally on
5 the surface and the top layer of the patterned
6 silicon layer; and
7 etching the etching buffer layer and the patterned
8 silicon layer until the thickness of the patterned silicon
9 layer is reduced.
- 1 2. The method as claimed in claim 1, wherein the
2 etching buffer layer comprises silicon oxide (SiO_2).
- 1 3. The method as claimed in claim 2, wherein the
2 etching buffer layer is formed by oxidation.
- 1 4. The method as claimed in claim 1, further
2 comprising Cl_2 , SF_6 , or HBr used during etching.
- 1 5. The method as claimed in claim 1, wherein the
2 thickness of the etching buffer layer is about 5~20nm.
- 1 6. The method as claimed in claim 1, wherein the
2 thickness of the patterned silicon layer is about
3 120~250nm.
- 1 7. A method of etching an uniform silicon layer,
2 comprising:
3 providing a silicon layer;
4 forming a mask with patterns on the silicon
5 layer;
6 performing a first etching to pattern the silicon
7 layer using the mask as a shield, to form a
8 patterned silicon layer with patterns;

9 removing the mask;
10 forming an etching buffer layer conformally on
11 the surface and the top layer of the patterned
12 silicon layer; and
13 performing a second etching to remove the etching buffer
14 layer and reduce the thickness of the patterned silicon
15 layer.

1 8. The method as claimed in claim 7, wherein the mask
2 is a photoresist layer.

1 9. The method as claimed in claim 7, wherein the
2 etching buffer layer comprises silicon oxide (SiO_2).

1 10. The method as claimed in claim 9, wherein the
2 etching buffer layer is formed by oxidation.

1 11. The method as claimed in claim 7, further
2 comprising Cl_2 , SF_6 , or HBr used during etching.

1 12. The method as claimed in claim 1, wherein the
2 thickness of the etching buffer layer is about 5~20nm.

1 13. The method as claimed in claim 7, wherein the
2 thickness of the patterned silicon layer is about
3 120~250nm.

1 14. A method of etching a silicon layer to avoid non-
2 uniformity, comprising:

3 providing a silicon layer;
4 forming a mask with patterns on the silicon
5 layer;

6 performing a first etching to pattern the silicon
7 layer using the mask as a shield, to form a
8 patterned silicon layer with patterns;

9 removing the mask;

10 introducing a gas containing oxygen treatment to
11 conformally form an etching buffer layer on the
12 surface and the top layer of the patterned silicon
13 layer; and

14 performing a second etching to remove the etching buffer
15 layer and reduce the thickness of the patterned silicon
16 layer.

1 15. The method as claimed in claim 14, wherein the
2 mask is a photoresist layer.

1 16. The method as claimed in claim 14, further
2 comprising Cl_2 , SF_6 , or HBr used during etching.

1 17. The method as claimed in claim 14, wherein the
2 thickness of the etching buffer layer is about 5~20nm.

1 18. The method as claimed in claim 14, wherein the
2 thickness of the patterned silicon layer is about
3 120~250nm.

1 19. The method as claimed in claim 14, wherein the gas
2 comprises 90%~100% oxygen and 10~0% etching agent
3 used in second etching.

1 20. The method as claimed in claim 14, wherein the gas
2 containing oxygen treatment is performed at about 10~90°C.